

found that the magnetic hold on the lids will be more secure if the magnet 51 is configured with a yoke, i.e., a U-shaped core with poles 52 and 53 arranged approximately parallel at some distance from each other and facing towards the lid. It is advantageous if the yoke of the electromagnet 51 with the legs or poles 52 and 53 and the turn-around portion 54 has a "soft" magnetization characteristic, so that the remanent magnetization will be as small as possible.

An anchor element 55 in the lid 32' is positioned opposite the magnet 51. As a design choice, the preferably ring-shaped anchor element 55 may have a plastic cover layer 56 and may be pressed or snapped into a recess 57 of the lid 32'. The lid 32' is seated in a centered position on the sample beaker 32, preferably by means of a centering rim 58, to ensure a precisely centered alignment of the anchor element 55 with the magnet 51. While a centering rim of the kind illustrated in Fig. 2 is preferred, it is obvious that one could also use individual projections distributed over the circumference of the lid 32', or a circumferential groove that is engaged by the rim of the beaker. For an analogous reason, i.e., to assure the centered positioning of each seating cutout 5 under the magnet 51, it is preferable to use a stepper motor as a drive source for the movement of the sample tray 4, because a stepper motor provides a more precise positioning than other kinds of motors.

It is obvious that one could also choose to have more than one magnet-anchor element in the lid 32'. However, this

would make the design of the lid-opening device somewhat more complex. In general, it will not be critical for the magnet-anchor element 55 to be exactly at the center of gravity of the lid 32'. However, with an offset anchor element, there could be malfunctions because the upward- and downward-directed forces acting on the lid are not in line with each other, so that the hold between the electromagnet and the magnet-anchor element is less secure. It is therefore preferred if the anchor element 55 is centered as much as possible.

In accordance with the advantageous embodiment described above, the anchor element 55 is covered from above by the plastic top layer 56 and from below by the bottom 59 of the recess 57. This has several advantages: On the one hand, aggressive vapors rising from the sample cannot corrode the metal of the anchor element 55 from below because the latter is protected by the bottom 59 of the recess. On the other hand, there is also protection from above, so that drops of an aggressive liquid falling on the lid 32' can likewise not corrode the anchor element. As a particularly preferred solution, rather than inserting the anchor element into a recess (as described above), the anchor element is completely molded into the lid 32', where the latter likewise consists of a non-magnetic material, particularly a polymer that is in general chemically inert.

In addition, the plastic layer 56 also serves as a spacer to ensure a minimum distance d from the magnet 51.

